AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.   (CURRENTLY AMENDED): A rapid restart method comprising:

saving, before restart of an OS, process information in the OS ~~relating to a user process~~ to a save area on a main memory device, the process information relating to a user process and comprising a process condition of the user process;

initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process; and

restoring the saved process information in the OS after the restart of the OS~~,~~

~~wherein the process information comprises a process condition.~~

2.   (PREVIOUSLY PRESENTED): A rapid restart method comprising:

saving, before restart of an OS, process information in the OS relating to a user process to a save area on a main memory device, while setting a restart flag for the saved process information to designate whether the process is to be restarted or not;

initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process for which the restart flag is set not to restart; and

restoring the saved process information of the user process for which the restart flag is set not to restart in the OS, after the restart of the OS,

wherein the process information comprises a process condition.

3.   **(PREVIOUSLY PRESENTED):** A rapid restart method comprising:

saving, before restart of an OS, process information in the OS relating to a user process to be continuously operated after restart of the OS, to a save area on a main memory device;

initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process; and

restoring the saved process information in the OS, after the restart of the OS,

wherein the process information comprises a process condition.

4.   **(PREVIOUSLY PRESENTED):** A rapid restart method comprising:

saving, before restart of an OS, process information in the OS relating to a user process to be continuously operated after restart of the OS, to a save area on a main memory device by referring to a process ID table in which an identifier for a process to be continuously operated or a process not to be continuously operated after restart of the OS;

initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process; and

restoring the saved process information in the OS, after the restart of the OS,

wherein the process information comprises a process condition.

5.   **(PREVIOUSLY PRESENTED):** A rapid restart method comprising:

saving, at generation of a user process, process information in the OS relating to the generated user process to a save area on a main memory device;

setting, at switching of the user process, a restart flag for the saved process information to designate whether the process is to be restarted or not, while updating the process information saved in the save area to the latest state if the process is not to be restarted;

nullifying the saved process information, at termination of the user process;

initializing, at restart of an OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process for which the restart flag is set not to restart; and

restoring, after the restart of the OS, the saved process information of the user process for which the restart flag is set not to restart in the OS,

wherein the process information comprises a process condition.

6.   **(ORIGINAL):** The rapid restart method according to Claim 2, wherein when a restart flag is set for process information relating to a certain user process to designate whether the process is to be restarted or not, all the user processes belonging to the same user application program as the user process are searched, and restart flags in

the process information relating to all the searched user processes are also set to the same value.

7.　　**(ORIGINAL):** The rapid restart method according to Claim 5, wherein when a restart flag is set for process information relating to a certain user process to designate whether the process is to be restarted or not, all the user processes belonging to the user application program as the user process are searched, and restart flags in the process information relating to all the searched user processes are also set to the same value.

8.　　**(ORIGINAL):** The rapid restart method according to Claim 1, wherein the OS is started up from an OS main memory image stored in a nonvolatile storage portion forming a part of the main memory device.

9.　　**(ORIGINAL):** The rapid restart method according to Claim 8, wherein every time occurs a write access from the OS to the nonvolatile storage portion during system operation, data in an address range having a predetermined width including the address at which the write access has occurred is copied from the nonvolatile storage portion to a substitute area ensured in a readable/writable main memory portion forming a part of the main memory device, and subsequent accesses to the address range having the predetermined width are converted to accesses to the substitute area.

10.   **(PREVIOUSLY PRESENTED):**   An information processing apparatus comprising:

process information saving means for saving, before restart of an OS, process information relating to a user process to a save area on a main memory device;

main memory initialization means for initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not initializing the save area used by the user process; and

process restoration means for restoring the saved process information in the OS, after the restart of the OS,

wherein the process information comprises a process condition.

11.   **(PREVIOUSLY PRESENTED):**   An information processing apparatus comprising:

process information saving means for saving, before restart of an OS, process information relating to a user process to a save area on a main memory device;

restart flag setting means for setting a restart flag for the saved process information to designate whether the process is to be restarted or not;

main memory initialization means for initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not initializing the save area used by the user process for which the restart flag is set not to restart; and

process restoration means for restoring, after the restart of the OS, the saved process information of the user process for which the restart flag is set not to restart in the OS,

wherein the process information comprises a process condition.

12.   **(PREVIOUSLY PRESENTED):**   An information processing apparatus comprising:

process information saving means for saving, before restart of an OS, process information in the OS relating to a user process to be continuously operated after restart of the OS, to a save area on a main memory device;

main memory initialization means for initializing, at the restart of the OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process; and

process restoration means for restoring the saved process information in the OS, after the restart of the OS,

wherein the process information comprises a process condition.

13.   **(ORIGINAL):** The information processing apparatus according to Claim 12, wherein, before the restart of the OS, the process information saving means saves process information in the OS relating to a user process to be continuously operated after restart of the OS, to the save area on the main memory device, by referring to a process

ID table storing identifiers of processes to be continuously operated or of processes not to be continuously operated.

14.   **(PREVIOUSLY PRESENTED):**   An information processing apparatus comprising:

process save area generating means for saving, at generation of a user process, process information in the OS relating to the generated user process to a save area on a main memory device;

process save information updating means for setting, at switching of the user process, a restart flag for the saved process information to designate whether the process is to be restarted or not, while updating the process information saved in the save area to the latest state if the process is not to be restarted;

process information save area releasing means for nullifying the saved process information, at termination of the user process;

main memory initialization means for initializing, at restart of an OS, a main memory area of the main memory device used by the OS while not restarting the save area used by the user process for which the restart flag is set not to restart; and

process restoration means for restoring, after the restart of the OS, the saved process information of the user process for which the restart flag is set not to restart, in the OS,

wherein the process information comprises a process condition.

15.   **(ORIGINAL):** The information processing apparatus according to Claim 11, comprising means for searching, when a restart flag is set for process information relating to a certain user process to designate whether the process is to be restarted or not, all the user processes belonging to the same user application program as the user process, and setting restart flags in the process information relating to all the searched user processes to the same value.

16.   **(ORIGINAL):** The information processing apparatus according to Claim 14, further comprising means for searching, when a restart flag is set for process information relating to a certain user process to designate whether the process is to be restarted or not, all the user processes belonging to the user application program as the user process, and setting restart flags in the process information relating to all the searched user processes to the same value.

17.   **(ORIGINAL):** The information processing apparatus according to Claim 10, further comprising means for starting up the OS from an OS main memory image stored in a nonvolatile storage portion forming a part of the main memory device.

18.   **(ORIGINAL):** The information processing apparatus according to Claim 17, comprising means for copying, at every occurrence of a write access from the OS to the nonvolatile storage portion during system operation, data in an address range having a

predetermined width including the address at which the write access has occurred from

the nonvolatile storage portion to a substitute area ensured in a readable/writable main

memory portion forming a part of the main memory device, and for converting

subsequent accesses to the address range having the predetermined width to accesses to

the substitute area.

19.   **(CURRENTLY AMENDED)**:   A <u>non-transitory computer-readable</u>

<u>recording medium having recorded thereon a </u>program for causing a computer to function

as:

process information saving means for saving, before restart of an OS, process

information in the OS relating to a user process to a save area on a main memory device;

main memory initialization means for initializing, at the restart of the OS, a main

memory area of the main memory device used by the OS while not initializing the save

area used by the user process; and

process restoration means for restoring the saved process information in the OS

after the restart of the OS,

wherein the process information comprises a process condition.

20.   **(CURRENTLY AMENDED)**:   A <u>non-transitory computer-readable</u>

<u>recording medium having recorded thereon a </u>program for causing a computer to function

as:

process information saving means for saving, before restart of an OS, process

information relating to a user process to a save area on a main memory device;

restart flag setting means for setting a restart flag for the saved process

information to designate whether the process is to be restarted or not;

main memory initialization means for initializing, at the restart of the OS, a main

memory area of the main memory device used by the OS while not initializing the save

area used by the user process for which the restart flag is set not to restart; and

process restoration means for restoring, after the restart of the OS, the saved

process information of the user process for which the restart flag is set not to restart in the

OS,

wherein the process information comprises a process condition.

21.   **(CURRENTLY AMENDED):**   A non-transitory computer-readable

recording medium having recorded thereon a program for causing a computer to function

as:

process information saving means for saving, before restart of an OS, process

information in the OS relating to a user process to be continuously operated after restart

of the OS, to a save area on a main memory device;

main memory initialization means for initializing, at the restart of the OS, a main

memory area of the main memory device used by the OS while not restarting the save

area used by the user process; and

process restoration means for restoring, after the restart of the OS, the saved

process information in the OS,

wherein the process information comprises a process condition.

22.   (CURRENTLY AMENDED): The non-transitory computer-readable

recording medium program according to Claim 21, wherein, before the restart of the OS,

the process information saving means saves process information in the OS relating to a

user process to be continuously operated after restart of the OS, to the save area on the

main memory device, by referring to a process ID table storing identifiers of processes to

be continuously operated or of processes not to be continuously operated.

23.   (CURRENTLY AMENDED):   A non-transitory computer-readable

recording medium having recorded thereon a program for causing a computer to function

as:

process save area generating means for saving, at generation of a user process,

process information in the OS relating to the generated user process to a save area on a

main memory device;

process save information updating means for setting, at switching of the user

process, a restart flag for the saved process information to designate whether the process

is to be restarted or not, while updating the process information saved in the save area to

the latest state if the process is not to be restarted;

process information save area releasing means for nullifying the saved process

information, at termination of the user process;

main memory initialization means for initializing, at restart of an OS, a main

memory area of the main memory device used by the OS while not restarting the save

area used by the user process for which the restart flag is set not to restart; and

process restoration means for restoring, after the restart of the OS, the saved

process information of the user process for which the restart flag is set not to restart in the

OS,

wherein the process information comprises a process condition.

24.   **(CURRENTLY AMENDED):** The non-transitory computer-readable

recording medium program according to Claim 20, wherein the program for causing

causes the computer to further function as means for searching, when a restart flag is set

for process information relating to a certain user process to designate whether the process

is to be restarted or not, all the user processes belonging to the same user application

program as the user process, and setting restart flags in the process information relating to

all the searched user processes to the same value.

25.   **(CURRENTLY AMENDED):** The non-transitory computer-readable

recording medium program according to Claim 23, wherein the program causes for

causing the computer to further function as means for searching all the user processes

belonging to the user application program as the user process, when a restart flag is set

for process information relating to a certain user process to designate whether the process

is to be restarted or not, and setting restart flags in the process information relating to all

the searched user processes to the same value.

26.   **(CURRENTLY AMENDED):** The <u>non-transitory computer-readable</u>

<u>recording medium</u> ~~program~~ according to Claim 19<u>, wherein the program causes</u> ~~for~~

~~causing~~ the computer to further function as means for starting up the OS from an OS

main memory image stored in a nonvolatile storage portion forming a part of the main

memory device.

27.   **(CURRENTLY AMENDED):** The <u>non-transitory computer-readable</u>

<u>recording medium</u> ~~program~~ according to Claim 26<u>, wherein the program causes</u> ~~for~~

~~causing~~ the computer to further function as means for copying, at every occurrence of a

write access from the OS to the nonvolatile storage portion during system operation, data

in an address range having a predetermined width including the address at which the

write access has occurred from the nonvolatile storage portion to a substitute area ensured

in a readable/writable main memory portion forming part of the main memory device,

and for converting subsequent accesses to the address range having the predetermined

width to accesses to the substitute area.

28.   **(PREVIOUSLY PRESENTED):** A method for restarting an OS in a

computer in which a first OS memory area for loading an OS and a process memory area

for loading processes are allocated on a main memory, and the OS and the processes are loaded in the respective areas, the OS restart method comprising:

a first step of acquiring process information, that is information for the OS to manage the processes, from the first OS memory area and storing the same in a save area provided in a predetermined storage device;

a second step of initializing the first OS memory area while holding the process memory area;

a third step of allocating a second OS memory area on the main memory and loading the OS therein; and

a fourth step of updating the process information in the OS memory area according to the process information stored in the first step,

wherein the process information comprises a process condition.

29.　　**(ORIGINAL):** The OS restart method according to Claim 28, further comprising the steps of:

selecting a process to be held from the processes loaded in the process memory area; and　　initializing the process memory area allocated to the processes not selected.

30.　　**(ORIGINAL):** The OS restart method according to Claim 28, wherein the save area is provided on the main memory.

31.   (ORIGINAL): The OS restart method according to Claim 28, wherein information indicating whether each of the processes is to be restarted or not is stored in the save area together with the process information of the relevant process.

32.   (ORIGINAL): The OS restart method according to Claim 28, wherein information indicating whether each of the processes is to be restarted or not is stored in a separate storage device from the storage device having the save area provided therein.

33.   (ORIGINAL): The OS restart method according to Claim 28, wherein processing to generate, update and release the save area are executed in accordance with the generation, switching and termination of a process on the storage device having the save area provided therein.

34.   (ORIGINAL): In the OS restart method according to Claim 28, a method for preliminarily preparing a nonvolatile storage device storing an image of the OS when it is loaded in the main memory, the third step referring to the image stored in the nonvolatile storage device to load the OS in the main memory.

35.   (ORIGINAL): The OS restart method according to Claim 28, further comprising the steps of:

loading a process including a plurality of processes associated with one application program in the process memory area;

selecting a process to be held from among the processes loaded in the process memory area; and

initializing the process memory area allocated to the processes other than the selected process and the other processes associated with the same application program as the selected process.